Optional accessories

810-038
Round table ø250mm
For large specimens

810-037
Round table ø180mm
For large specimens

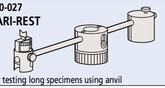
810-040
V anvil (large)
ø40mm, groove width 30mm
For large specimens

810-043
Spot anvil
ø12mm
For sheet specimens

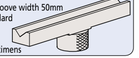
810-041
V anvil (small)
ø40mm, groove width 6mm
For cylindrical specimens

810-044
Spot anvil
ø5.5mm
For sheet specimens

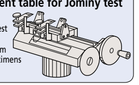
810-027
VARI-REST
For testing long specimens using anvil



810-029
Special V anvil
Length 400mm, groove width 50mm
Supports the standard hardenability test for steel
For cylindrical specimens



810-026
Fine adjustment table for Jominy test
Fine adjustment table for Jominy test
Length 400mm
groove width 50mm
For cylindrical specimens

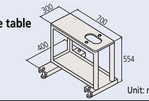


810-030
Diamond spot anvil
10mm
For sheet specimens

810-042
Small V anvil
ø10mm
For cylindrical specimens

810-028
Jack rest
For testing long specimens using table or anvil

810-048
Console table



264-504
Digimatic mini processor DP-1VR
* No connection cable supplied.
(Should be ordered separately)
Connection cable (1m) 937387

06ADV380E
USB Direct Input Tool
The USB plug is connected to a computer

Item	Order No.
Hardness standard block 32HRB	19BAA028
Hardness standard block 42HRB	19BAA029
Hardness standard block 52HRB	19BAA030
Hardness standard block 62HRB	19BAA031
Hardness standard block 72HRB	19BAA032
Hardness standard block 82HRB	19BAA033
Hardness standard block 92HRB	19BAA034
Hardness standard block 10HRC	19BAA035
Hardness standard block 20HRC	19BAA036
Hardness standard block 30HRC	19BAA037
Hardness standard block 40HRC	19BAA038
Hardness standard block 50HRC	19BAA039
Hardness standard block 60HRC	19BAA040
Hardness standard block 70HRC	19BAA041
Hardness standard block 41HR30N	19BAA042
Hardness standard block 50HR30N	19BAA043
Hardness standard block 60HR30N	19BAA044
Hardness standard block 73HR30N	19BAA045
Hardness standard block 83HR30N	19BAA046
Hardness standard block 75HR15N	19BAA047
Hardness standard block 85HR15N	19BAA048
Hardness standard block 90HR15N	19BAA049
Hardness standard block 32HR30T	19BAA050
Hardness standard block 42HR30T	19BAA051
Hardness standard block 52HR30T	19BAA052
Hardness standard block 62HR30T	19BAA053
Hardness standard block 72HR30T	19BAA054
Hardness standard block 78HR15T	19BAA055
Hardness standard block 82HR15T	19BAA056
Hardness standard block 87HR15T	19BAA057
Hardness standard block 40-50HRC	19BAA124
Hardness standard block 30-35HRB	19BAA127
Hardness standard block 64-69HR30N	19BAA128
Hardness standard block 36-40HR30T	19BAA150
Diamond indenter (For HR-***MR)	19BAA072
Diamond indenter (For HR-***MS)	19BAA073
Steel ball indenter 1/16"	19BAA074
Steel ball indenter 1/8"	19BAA075
Steel ball indenter 1/4"	19BAA076
Steel ball indenter 1/2"	19BAA077

For Brinell hardness testing, the following optional accessories are required: an indenter, a weight set and a measurement microscope.

Hardness testing machine	Weight set		Indenters for Brinell test			
			19BAA277	19BAA279	19BAA280	19BAA284
	Order No.	Item	ø1mm	ø2.5mm	ø5mm	ø10mm
HR-110MR HR-210MR	56AAK286	Brinell weight set for HR-110MR, 210MR 62.5 125 187.5	—	HBW2.5/62.5 HBW2.5/187.5	HBW5/62.5 HBW5/125	(HBW10/100*)
HR-320MS	56AAK287	Brinell weight set for HR-320MS 31.25 62.5 125 187.5	(HBW1/10*) (HBW1/30*)	HBW2.5/31.25 HBW2.5/62.5 HBW2.5/187.5	HBW5/62.5 HBW5/125	(HBW10/100*)
HR-430MR	56AAK288	Brinell weight set for HR-430MR 62.5 125 187.5	—	HBW2.5/62.5 HBW2.5/187.5	HBW5/62.5 HBW5/125	(HBW10/100*)
HR-430MS	56AAK289	Brinell weight set for HR-430MS 31.25 62.5 125 187.5	(HBW1/10*) (HBW1/30*)	HBW2.5/31.25 HBW2.5/62.5 HBW2.5/187.5	HBW5/62.5 HBW5/125	(HBW10/100*)

	Spare cemented carbide ball			
Order No.	19BAA281	19BAA283	19BAA162	19BAA163
Item	1mm	2.5mm	5mm	10mm
Size (Quantity)	ø1mm (1 pc.)	ø2.5mm (1 pc.)	ø5mm (1 pc.)	ø10mm (1 pc.)

*The built-in weights are used for this range. Only an indenter need be selected.

Measurement microscope for Brinell hardness test

Order No.	Item
19BAA161	Measurement microscope (20X model)
19BAA318	Measurement microscope (40X model)
19BAA319	Measurement microscope (100X model)

Other Rockwell hardness testing machines in the HR Series lineup

Mitutoyo provides a choice of various kinds of hardness testing machine: for example, the high-functionality HR500 series Rockwell type that enables non-destructive testing of the inner wall of a tubular specimen, and which can perform all operations from initial loading right through to the calculation of hardness fully automatically. Other types of hardness testing machine include Vickers, Micro-Vickers, Brinell and Shore.

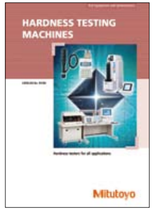
Rockwell Type Hardness Testing Machines wiZhard HR-500 Series

810-208
HR-511

810-202
HR-521
810-203
HR-522

810-204
HR-523

Refer to the HARDNESS TESTING MACHINES brochure (E4104) for more details.



Export permission by the Japanese government may be required for exporting our products according to the Foreign Exchange and Foreign Trade Law. Please consult our sales office near you before you export our products or you offer technical information to a nonresident.

Coordinate Measuring Machines
Vision Measuring Systems
Form Measurement
Optical Measuring
Sensor Systems
Test Equipment and Seismometers
Digital Scale and DRO Systems
Small Tool Instruments and Data Management

Note: All information regarding our products, and in particular the illustrations, drawings, dimensional and performance data contained in this pamphlet, as well as other technical data are to be regarded as approximate average values. We therefore reserve the right to make changes to the corresponding designs, dimensions and weights. The stated standards, similar technical regulations, descriptions and illustrations of the products were valid at the time of printing. Only quotations submitted by ourselves may be regarded as definitive.
Our products are classified as regulated items under Japanese Foreign Exchange and Foreign Trade Law. Please consult us in advance if you wish to export our products to any other country. If the purchased product is exported, even though it is not a regulated item (Catch-All controls item), the customer service available for that product may be affected. If you have any questions, please consult your local Mitutoyo sales office.

Mitutoyo Corporation
20-1, Sakado 1-chome,
Takatsu-ku, Kawasaki-shi,
Kanagawa 213-8533, Japan
T +81 (0) 44 813-8230
F +81 (0) 44 813-8231
http://www.mitutoyo.co.jp

Mitutoyo

Rockwell Hardness Testing Machines
HR-100/200/300/400 Series

Catalog No. E17000

026 1102 (1) C-PAHS, Printed in Japan

Mitutoyo

Five economical Rockwell hardness testing machines to suit practically every application...

5 series Lineup

HR-110MR Order No.963-210

Rockwell hardness testing machine

An environmentally friendly energy-saving model.
The basic operation is all manual, including weight changing (total test force selection).

HR-210MR Order No.963-220

Rockwell hardness testing machine

Manual weight changing (with total test force selected) and handling of preliminary test force. Motor drive controls loading sequence.

HR-320MS Order No.963-231

Dual type (Rockwell/Rockwell superficial) hardness testing machine

Manually handles test force and preliminary test force selection. Motor drive controls loading sequence.

HR-430MR Order No.963-240

Rockwell hardness testing machine

Economy type, but supports dial switching power steering and support of all test standards and equipped with automatic brake handle auto start feature. Motor drive loads controls loading sequence.

HR-430MS Order No.963-241

Twin type (Rockwell/Rockwell superficial combined use) hardness test equipment

Economy type, but supports dial switching power steering and support of all test standards and equipped with automatic brake handle auto start feature. Motor drive controls loading sequence.

Features

◆The newly designed frame provides maximum clearance for positioning the workpiece. A flat table is all that is needed for mounting these testing machines.

◆Simple to operate
With analogue type (HR-110MR, HR-210MR), the gauge presetting operation is unnecessary by the adoption of an automatic presetting dial gauge.

◆HR-110MR does not require a power source, and is considered to be environmental friendly.

• The digital type (HR-430MR and HR-430MS), with the adoption of the automatic steering wheel brake & the automatic load sequence, with only simple handling test possibility.

◆The digital type (HR-320MS, HR-430MR and HR-430MS) has digimatic output and our Digimatic Mini-Processor (DP-1VR) to print and input tools (USB-ITN-E) to connect to a PC and use for data transfer.

◆Brinell hardness tests can be performed by using the following optional accessories: a Brinell indenter, a weight set and a measurement microscope.

Mitutoyo

SPECIFICATIONS

Code No.	963-210	963-220	963-231	963-240	963-241
Model No.	HR-110MR	HR-210MR	HR-320MS	HR-430MR	HR-430MS
Type of hardness test	Rockwell				
	—	—	Rockwell superficial	—	Rockwell superficial
Standard	JIS B 7726 ISO6508-2 (ASTM E18)				
Display	Analog		Digital		
Minimum reading	0.5HR graduation		0.1HR indication		
Preliminary test force (handling support)	Automatic pre-setting dial gauge		Loading navigator indication	Automatic steering wheel brake	
Preliminary test force setting	—	—	Dial switching	—	Dial switching
Total test force setting	Weight change			Dial switching	
Total test force control	Manual	Motor drive Button start		Motor drive Automatic start	
Test force duration	Manual	Fixed 3-5.5s or manual		3-60s setting or manual operation	
Maximum specimen height	180mm (100mm if cover is attached)				
Maximum specimen depth	165mm (from indenter axis to the frame)				
Function	—	—	Success or failure decision function		
	—	—	Offset revision function		
	—	—	Hardness conversion function		
Data output	—	—	Digimatic (SPC), RS-232C		
Power supply	No power required	AC100-240V, 1.2A			
Dimensions	Approximately 296(W) x 512(D) x 780(H)mm	Approximately 235(W) x 512(D) x 780(H)mm	Approximately 235(W) x 516(D) x 780(H)mm		
Mass	Approximately 49kg	Approximately 47kg	Approximately 47kg	Approximately 50kg	

STANDARD ACCESSORIES

Brinell hardness tests can be performed by using the following optional accessories: a Brinell indenter, a weight set and a measurement microscope.

Order No.	Item	Description	Order No.	Item	Description
—*1	Diamond indenter	For R (for HR-xxxMR)	—	Hardness test block	65HR30N (only HR-xMS attachment)
—*1	Diamond indenter	For R/S (for HR-xxxMS)	—	Hardness test block	70HR30T (only HR-xMS attachment)
—	Steel ball indenter	ø1/16" (ø1.5875mm)	357651	AC adapter	AC100-240V, 1.2A DC12V, 3.5A
—	Steel ball (spare)	ø1/16" (ø1.5875mm)	02ZAA000	AC adapter	—
—	Flat anvil	ø64mm		User's manual	
—	V-anvil (large)	ø40mm,120° V-groove 30mm wide	56AAK312	Vinyl cover	
—	Hardness test block	60HRC	—	Accessory box	
—	Hardness test block	30HRC	—	Level	
—	Hardness test block	90HRB			

*1: Available for specific model.

ROCKWELL HARDNESS SCALE

	Scale	Hardness symbol*1	Indenter	Preliminary test force	Total test force	Hardness range applicable	Standard
Rockwell hardness	A	HRA	Conical diamond	98.07N (10kgf)	588.4N (60kgf)	20-95HRA	ISO6508-1 JIS Z 2245 Coverage
	D	HRD			980.7N (100kgf)	40-77HRD	
	C	HRC			1471N (150kgf)	10-70HRC	
	F	HRF	Sphere ø1.5875mm (1/16")		588.4N (60kgf)	60-100HRF	
	B	HRB			980.7N (100kgf)	20-100HRB	
	G	HRG			1471N (150kgf)	30-94HRG	
	H	HRH	Sphere ø3.175mm (1/8")		588.4N (60kgf)	80-100HRH	
	E	HRE			980.7N (100kgf)	70-100HRE	
	K	HRK			1471N (150kgf)	40-100HRK	
	L	HRL	Sphere ø6.35mm (1/4")		588.4N (60kgf)		
	M	HRM			980.7N (100kgf)		
	P	HRP			1471N (150kgf)		
	R	HRR	Sphere ø12.7mm (1/2")		588.4N (60kgf)		
	S	HRS			980.7N (100kgf)		
	V	HRV			1471N (150kgf)		

	Scale	Hardness symbol*1	Indenter	Preliminary test force	Total test force	Hardness range applicable	Standard
Rockwell Superficial hardness	15N	HR15N	Conical diamond	29.42N (3kgf) Coverage	147.1N (15kgf)	70-94HR15N	ISO6508-1 JIS Z 2245 Coverage
	30N	HR30N			294.2N (30kgf)	42-86HR30N	
	45N	HR45N			441.3N (45kgf)	20-77HR45N	
	15T	HR15T	Sphere ø1.5875mm (1/16")		147.1N (15kgf)	67-93HR15T	
	30T	HR30T*2			294.2N (30kgf)	29-82HR30T	
	45T	HR45T			441.3N (45kgf)	10-72HR45T	
	15W	HR15W	Sphere ø3.175mm (1/8")		147.1N (15kgf)		
	30W	HR30W			294.2N (30kgf)		
	45W	HR45W			441.3N (45kgf)		
	15X	HR15X	Sphere ø6.35mm (1/4")		147.1N (15kgf)		
	30X	HR30X			294.2N (30kgf)		
	45X	HR45X			441.3N (45kgf)		
	15Y	HR15Y	Sphere ø12.7mm (1/2")		147.1N (15kgf)		
	30Y	HR30Y			294.2N (30kgf)		
	45Y	HR45Y			441.3N (45kgf)		

*1: In the case of scales which specify a spherical indenter, a letter should be appended to the hardness symbol ("S" for steel, "W" for tungsten carbide) when quoting the measurement result to show that it was obtained with an indenter made of the indicated material.

*2: Applied to a specimen of less than 0.6mm thickness a special test, which takes account of the influence of the impression made by the test sphere on such a thin specimen, may be designated as HR30Tm and is defined in JIS Z 2245 appendix A.